Quiz 13

Part a) $a_1 = 3$ $\qquad$ $a_2 = 2\cdot 3 - 1 = 5$

$a_{n+1} = 2a_n - 1$ $\qquad$ $a_3 = 2\cdot 5 - 1 = 9$

$a_4 = 2\cdot 9 - 1 = 17$

$a_5 = 2\cdot 17 - 1 = 33$

Part b) $\sum_{n=1}^{\infty} (x-4)^n = \sum_{n=1}^{\infty} (x-4)^1 \cdot (x-4)^{n-1}$ This is a geometric series of the form $\sum_{n=1}^{\infty} ar^{n-1}$

with $a = (x-4)^1$ and $r = x-4$ and converges when $|r|<1$ or in this case when $|x-4|<1$ which implies $-1 < x-4 < 1$ which implies $3 < x < 5$. The series converges to $\frac{a}{1-r} = \frac{x-4}{1-(x-4)} = \frac{x-4}{5-x}$ whenever $3<x<5$.

↑ Interval of conv.